# MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

VOL. XXIII. OCTOBER, 1895. No. 10

## INTRODUCTION.

The REVIEW for October, 1895, is based on reports from 2,760 stations occupied by regular and voluntary observers, classified as follows: 149 from Weather Bureau stations; 35 from U. S. Army post surgeons; 2,416 from voluntary observers; 34 from Canadian stations; 96 received through the Southern Pacific Railway Company; 30 from U. S. Life-Saving stations; international simultaneous observations are received from a few stations and used together with trustworthy newspaper extracts and special reports.

The WEATHER REVIEW is prepared under the general editorial supervision of Prof. Cleveland Abbe. Unless otherwise specifically noted, the text is written by the Editor, but the statistical tables are furnished by Mr. A. J. Henry, Chief of the Division of Records and Meteorological Data. A special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada.

## CLIMATOLOGY OF THE MONTH.

### GENERAL CHARACTERISTICS.

The mean temperature was generally deficient. Precipitation was deficient everywhere, except in southern Florida. High pressure and clear skies generally prevailed. The drought in the Ohio Valley continued severe. Local storms of all kinds were remarkably infrequent. Hurricanes from the West Indian region approached our coasts, but turned off before doing much damage. Unusual storms visited the Gulf of California and the Pacific coast of Mexico. The earthquake of the 31st was widely felt; it was most severe in southeastern Missouri and southern Illinois, but did only slight damage.

### ATMOSPHERIC PRESSURE.

[In inches and hundredths.]

The distribution of mean atmospheric pressure reduced to sea level, as shown by mercurial barometers, not reduced to standard gravity, and as determined from observations taken daily at 8 a. m. and 8 p. m. (seventy-fifth meridian time), is shown by isobars on Chart II. That portion of the reduction to standard gravity that depends on latitude is shown by the numbers printed on the right-hand border.

The *mean pressures* during the current month were highest along a narrow ridge extending from Alabama and Tennessee westward to Oklahoma and Kansas, and thence northwest into British Columbia.

The highest were: Lander, 30.22; Cheyenne and Denver, 30.18; North Platte and Kansas City, 30.17. The lowest mean pressures were in southern California and Arizona, and pressure was also low north of the Lake Region and the mouth of the St. Lawrence.

The lowest were: Yuma, 29.86; Bird Rocks, 29.87; and Father Point, 29.90.

*As compared with the normal* for October, the mean pressure was in excess over the whole interior of the United States, and highest over the region between Oklahoma and Alberta.

The greatest excesses were: Lander, 0.14; Denver and Wichita, 0.12; Cheyenne, North Platte, Dodge City, and Pueblo, 0.11.

Pressure was deficient in Oregon, California, and Arizona, and also in the northern portion of the Lake Region.

The greatest deficits were: Rockliffe, 0.10; Block Island, 0.06; Nantucket, Portland, Me., Marquette, and Roseburg, 0.06; Yuma and Sacramento, 0.05.

*As compared with the preceding month* of September, the pressures, reduced to sea level, show a very general rise over the whole country west of the lower Lake Region and South Atlantic States. The greatest rises were: Cheyenne, 0.26; Denver and Lander, 0.25; Pueblo and Huron, 0.23; Concordia, Sioux City, Pierre, and Miles City, 0.22. The greatest falls were: Key West, Jupiter, and Nantucket, 0.04; Rockliffe, 0.03.

### AREAS OF HIGH AND LOW PRESSURE.

[By Prof. FRANK H. BIGELOW.]

The tracks of thirteen areas of high pressure are plotted on Chart IV for the month of October. This chart shows that these tracks are confined almost exclusively to the southern circuit, only one having crossed the Great Lakes. Instead of originating near the coast line, as in summer, they showed a marked tendency to form along the high land of the mountain plateau; they spread southeastward along the Slope, five of them reaching the Atlantic coast, and two the Gulf of St. Lawrence.

The tracks of fifteen areas of low pressure are plotted on Chart I. Without exception all of these appeared first in the northwest, near the northern boundary of the United States, and moved east in the northern circuit, very near the axis of the mean storm track. There are only four unimportant departures from this mean course noted during the entire month. These depressions passed to the south and east of Florida, as West India cyclones, whose tracks remained so far out at sea as to make it difficult to plot correctly the real track followed; another slight disturbance occurred in the west Gulf.

Taken altogether the month of October presents a remarkable case of conformity to the normal conditions of the season. The location of the high and the low tracks is so distinct that from it the mean type of the weather, which is usually broken in upon by abnormal conditions, may be inferred. The month was generally dry, and the precipitation was confined in a simple way to the fronts of the advancing highs.

*Movements of centers of areas of high and low pressure.*

| Number. | First observed. | | | Last observed. | | | Path. | | Average velocities. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Date. | Lat. N. | Long. W. | Date. | Lat. N. | Long W. | Length. | Duration. | Daily. | Hourly. |
| **High areas.** | | ° | ° | | ° | ° | *Miles.* | *Days.* | *Miles.* | *Miles.* |
| I | 1, a.m. | 38 | 87 | 2, p.m. | 37 | 80 | 690 | 1.5 | 460 | 19.1 |
| II | 2, a.m. | 44 | 125 | 5, a.m. | 41 | 96 | 1,820 | 3.0 | 607 | 25.2 |
| III | 2, a.m. | 50 | 96 | 4, p.m. | 48 | 65 | 1,490 | 2.5 | 596 | 24.7 |
| IV | 5, p.m. | 41 | 113 | 6, a.m. | 42 | 112 | 120 | 0.5 | ..... | ..... |
| V | 6, a.m. | 50 | 114 | 12, p.m. | 46 | 59 | 3,570 | 6.5 | 580 | 24.1 |
| VI | 9, a.m. | 46 | 123 | 13, p.m. | 35 | 88 | 2,500 | 4.5 | 555 | 23.0 |
| VII | 12, p.m. | 51 | 109 | 19, a.m. | 35 | 76 | 4,110 | 6.5 | 632 | 26.2 |
| VIII | 17, a.m. | 50 | 120 | 22, p.m. | 46 | 64 | 4,160 | 5.5 | 756 | 31.4 |
| IX | 20, a.m. | 44 | 113 | 26, p.m. | 27 | 81 | 3,760 | 6.5 | 578 | 24.0 |
| X | 24, a.m. | 42 | 110 | 25, p.m. | 40 | 115 | 1,010 | 1.5 | 673 | 27.9 |
| XI*a* | 26, a.m. | 47 | 117 | 28, a.m. | 43 | 100 | 1,230 | 2.0 | 615 | 25.5 |
| XI*b* | 27, a.m. | 43 | 105 | 27, p.m. | 35 | 100 | 620 | 0.5 | ..... | ..... |
| XII | 27, p.m | 51 | 105 | 31, p.m. | 47 | 61 | 2,970 | 4.0 | 743 | 30.9 |
| XIII | 30, p.m. | 58 | 103 | 31, p.m. | 34? | 100? | 1,460? | 1.0 | ..... | ..... |
| Sums | ..... | ..... | ..... | ..... | ..... | ..... | 29,510 | 46.0 | 6,765 | ..... |
| Mean of 11 paths | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 615 | 25.6 |
| Mean of 46.0 days | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 642 | 26.6 |
| **Low areas.** | | | | | | | | | | |
| I | 1, a.m. | 24 | 82 | 7, a.m. | 48 | 55 | 2,490 | 6.0 | 415 | 17.3 |
| II | 1, a.m. | 50 | 97 | 2, p.m. | 49 | 68 | 1,470 | 1.5 | 980 | 40.7 |
| III | 1, a.m. | 47 | 123 | 4, a.m. | 49 | 96 | 2,310 | 3.0 | 770 | 32.0 |
| IV | 4, p.m. | 52 | 117 | 9, a.m. | 47 | 59 | 2,790 | 4.5 | 602 | 25.0 |
| V | 8, a.m. | 53 | 112 | 15, a.m. | 49 | 54 | 3,770 | 7.0 | 539 | 22.4 |
| VI | 11, a.m. | 54 | 114 | 13, a.m. | 48 | 86 | 1,330 | 2.0 | 665 | 27.5 |
| VII | 14, p.m. | 53 | 115 | 18, p.m. | 46 | 57 | 2,860 | 4.0 | 715 | 29.5 |
| VIII | 15, a.m. | 25 | 79 | 16, a.m. | 27 | 79 | 130 | 1.0 | 130 | 5.4 |
| IX | 16, p.m. | 50 | 115 | 20, p.m. | 48 | 58 | 2,750 | 4.0 | 688 | 28.6 |
| X | 19, p.m. | 55 | 114 | 23, p.m. | 47 | 60 | 2,840 | 4.0 | 710 | 29.5 |
| XI | 19, p.m. | 18 | 80 | 23, a.m. | 34 | 74 | 1,190 | 3.5 | 340 | 14.1 |
| XII | 23, a.m. | 54 | 110 | 26, a.m. | 47 | 57 | 2,600 | 3.0 | 867 | 36.0 |
| XIII | 24, p.m. | 52 | 112 | 29, a.m. | 65 | 50 | 2,490 | 4.5 | 553 | 23.0 |
| XIV | 30, a.m. | 28 | 97 | 31, a.m. | 30 | 89 | 510 | 1.0 | 510 | 21.2 |
| XV | 30, a.m. | 52 | 95 | 31, p.m. | 40 | 75 | 1,320 | 1.5 | 880 | 36.5 |
| Sums | ..... | ..... | ..... | ..... | ..... | ..... | 30,850 | 50.5 | 9,364 | ..... |
| Mean of 15 paths | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 624 | 25.9 |
| Mean of 50.5 days | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | 611 | 25.4 |

HIGH AREAS.

I.—The month of October opened with a very extensive high covering the entire United States, being central in southern Indiana. It moved eastward to Virginia, and on the 3d was merged into high No. III, that had advanced to the Lake Region. Killing and light frosts occurred in the Lake Region, the upper Mississippi and Ohio valleys, and the Middle Atlantic States, as far south as North Carolina. They continued with less intensity on the mornings of the 2d and 3d.

II.—This area and No. VI are the only ones plotted on the immediate Pacific Coast during the month. No. II began on the 2d, crossed the northern Plateau on the 3d, and disappeared on the 5th, along the eastern slope with the center in the Missouri Valley. Some light showers occurred on the Rocky Mountain Slope during the 3d and 4th, and a slight temperature fall accompanied the high.

III.—A high formed in the upper Mississippi Valley on the 2d and moved eastward to the Gulf of St. Lawrence by the 4th. It contributed to the frosts of the 3d and 4th, but otherwise gives no feature for observation.

IV.—This was a sporadic high in Utah on the 5th and 6th, surviving only one day, when it was drawn into a stronger high to the north of it.

V.—The next high appeared during the 6th to the north of Montana, and advanced to North Dakota on the 7th, Missouri on the 8th, West Virginia on the 9th, the North Carolina coast on the 10th, and Nova Scotia on the 12th, where it disappeared. It brought frosts on the 8th in the Missouri Valley and the upper Mississippi Valley, on the 9th in the middle Mississippi Valley, on the 10th generally east of the Mississippi River, and on the 11th in New England. The weather was dry during this interval, and a moderate temperature fall accompanied the eastward progress of the high.

VI.—This high pressure area appeared on the north Pacific Coast on the 9th, passed into Idaho on the 10th, moved down the middle Slope to Kansas on the 11th, to northern Texas on the 12th; on this date it divided, one center being located in northern Texas and the other in Illinois, but these united again on the 13th, in Tennessee, where the high disappeared. After crossing the mountains showers appeared in front of it in the Mississippi Valley on the 11th and 12th, followed by frost in the same districts on the morning of the 13th. The temperature fall accompanying the high was small.

VII.—On the 12th a high formed in Alberta, which moved slowly southward over the mountain slope into Colorado by the 15th, where it remained with uncertain location of the center during the 16th; thence advanced more rapidly eastward to Tennessee by the 17th, and to the North Carolina coast by the 18th, where it faded away on the 19th. During its entire course it was almost entirely free from precipitation in its neighborhood, and from frost, the changes in temperature at the same time being very slight.

VIII.—This high had a long track and its movement was quite rapid. It passed from the State of Washington on the 17th into Alberta on the 18th, and Oklahoma on the 19th, lingered in northern Texas on the 20th, turned to the northeast with a rapid movement, reaching Massachusetts on the 21st and Nova Scotia on the 22d, where it disappeared. Aside from some frosts in the lower Mississippi Valley on the 20th, and in the eastern Gulf States on the 21st, there is little to remark. A hurricane developed over the West Indies, which passed northeast near the Bahama Channel on the 21st and 22d; this was probably sustained to some extent by the action of this high.

IX.—The course of this high extended from the northern Rocky Mountain Plateau southeastward to the Florida Peninsula, though for a portion of the time it could hardly be distinguished from the normal pressures of the Gulf States. It began in Idaho on the 20th, moved northward to Montana on the 21st, and into Alberta on the morning of the 22d, whence it turned and worked quickly southeastward, reaching Missouri on the 23d, the North Carolina coast on the 24th, and the Florida Peninsula on the 25th, falling to the normal on the 26th. A few light showers occurred in Kentucky, Tennessee, and North Carolina on the 25th, but otherwise the weather was nearly dry throughout this interval. A temperature fall of 10° to 20° attended the advance of this high, but few frosts were reported.

X.—On the 24th and 25th a high covered the middle Plateau, hardly to be distinguished from the preceding number, and forming with it an almost continuous high belt, near the normal axis of the annual high.

XI.—The location of the center of high pressure in the Rocky Mountains on the 26th to 28th is uncertain. Apparently it was highest in Washington on the 26th, and in Wyoming on the 27th, when a division took place; one portion remained in Wyoming and South Dakota on the 28th, where it disappeared; the second center moved into northern Texas on the 27th, when this passed away from observation. The first center may be described as having been absorbed in No. XII, which formed to the northward of it. Some rain fell in the central Mississippi Valley on the 27th, and a little frost followed on the 28th in the same locality. The temperature changes amounted from 20° to 30° in the Rocky Mountain Slope Region.

XII.—This high formed to the north of Montana on the 27th, and remained near the same place during the 28th, whence it moved to Missouri on the 29th, to Vermont on the 30th, and to the Gulf of St. Lawrence on the 31st. Nos. V, VIII, XII, pursued nearly the same track, and are interesting as showing the normal formation and movements of highs in the United States. On the 30th some quite heavy rains fell to the southwest of the high in Texas and the neighboring States, the barometer being generally above the normal, except on the western Gulf Coast. During this time a cyclonic area was forming in the west Gulf, which appeared distinctly on the 31st (see low area No. XIV). The passage of this high was unattended by frosts, and the temperatures were nearly stationary.

XIII.—The last high of the month appeared in the Saskatchewan Valley on the 30th, moved directly southward to Texas on the 31st, though it covered the mountain districts generally during this time, and continued so at the end of the month.

AREAS OF LOW PRESSURE.

I.—On the morning of the 1st there was evidence of a cyclonic disturbance to the south of the Florida Peninsula, the center not being clearly determined, though the barometer reading 29.80 was reported at Habana, with high northeasterly winds over southern Florida. The conditions did not materially change during the 2d, but on the 3d it was evident that a northeasterly track was to be expected, and the center was located to the eastward of Florida, with a barometer of 29.76 at Nassau, and northerly winds over the peninsula. Considerable swell was reported along the south Atlantic coast, but apparently there was no other very violent action of the storm. On the 4th the barometer had risen to 29.88 at Habana, and to 29.82 at Nassau. After this a moderate depression advanced rapidly up the Atlantic coast, with center undetermined to the eastward, being opposite New Jersey on the 5th, Nova Scotia on the 6th, and Newfoundland on the 7th.

II.—On the morning of the 1st, an insignificant depression was central in the valley of the Red River of the North, which passed to the Gulf of St. Lawrence by the evening of the 2d, producing very little effect upon the weather.

III.—Also on the 1st a third depression existed on the north Pacific coast, which moved eastward to Manitoba on the 2d, was deflected southward to Nebraska on the 3d, but returned to the northern circuit on the 4th, where it disappeared, causing very slight changes in the weather conditions.

IV.—On the 4th a low center formed over Alberta, moved steadily eastward to Lake Superior on the 6th, and to the Gulf of St. Lawrence on the 8th. It developed a trough toward the southwest on the 6th, and rain fell in the Mississippi Valley, the rain area extended to the Atlantic States, with occasional showers and a few thunderstorms on the 7th and 8th; its influence ended on the 9th.

V.—This storm was of moderate intensity, and began in Alberta on the 8th, moved to North Dakota on the 9th, to Lake Superior on the 10th, where a little rain fell over the Lakes, to Lake Erie on the 11th, a small rainfall area covering the Ohio Valley, to the New Jersey coast over the Middle States on the 12th, where an extensive area of precipitation was developed in the Middle Atlantic States and portions of the east Gulf States. On the 13th it increased to decided intensity in New England, with a barometer reading of 29.40, heavy rains and northwest gales on the coast, and on the 14th it passed to the northeast, the storm clearing in New England, and disappeared from observation on the 15th.

VI.—On the 11th a feeble low appeared in Alberta behind the high that covered the Plateau, and moved to Lake Superior by the 13th, where it died out, having produced no noteworthy effects.

VII.—On the afternoon of the 15th a low area formed north of Montana, which moved to the Gulf of St. Lawrence in the northern circuit, reaching Winnipeg on the 15th, the middle St. Lawrence Valley on the 16th, the Gulf on the 17th, and Newfoundland on the 18th. Very little rain accompanied the course of this low, which was well defined, but not energetic throughout its course.

VIII.—On the 15th and 16th the observations indicated a feeble cyclonic disturbance to the southeast of the Florida Peninsula, the reading of the barometer at Jupiter being 29.88 on the morning of the 15th. About the same pressure continued on the 16th and 17th, but no indications of the central storm track are found.

IX.—This low passed from Alberta on the 16th, to the Gulf of St. Lawrence on the 20th, in the mean northern track, with well-defined isobars, and almost no rainfall throughout its course. Such instances as Nos. VII and IX show that precipitation is not necessary to the formation and advance of cyclonic gyrations of the air. On the other hand, it is to be noted that storms from the southwest appear to be greatly energized by accompanying heavy rainfalls, the winds in the latter case being more violent.

X.—This low area appeared in Alberta on the 19th and moved directly eastward to the Gulf of St. Lawrence on the 24th. The description of it would be like the preceding, and it is another instance of a storm in the northern circuit without important rainfall.

XI.—This was the only destructive hurricane that developed in the West India Islands during the month of October. On the 19th the barometer reading at Santiago de Cuba was 29.84, the winds there and in Florida showed that the disturbance was central south or southeast of Cuba. On the 20th it was still south of Cuba, but moving due north, as nearly as could be determined. On the night of the 20th it crossed Cuba, and on the 21st was between Cuba and Nassau, the pressure being 29.74 at Habana and 29.84 at Nassau in the morning, and 29.62 at Key West in the evening. The pressure fall was well marked over Florida, and by the 22d the center was between Nassau and the mainland. Reports from the office of the colonial secretary, Nassau, Bahamas, shows that the center passed over Hope Town, Green Turtle Cay, Cherokee Sound, Abaco Island, Golden Grove, Grand Bahama Island, and Bemini on the morning of the 22d causing much destruction to crops and the wreck of the *Mary C. Decker* near Winding Bay, Cherokee Sound, at 4 o'clock in the morning. The storm passed near Bermuda on the morning of the 24th, where the barometer reading of 29.16 was reported. Wind velocities of 55 miles an hour were reported from Jupiter and Key West, and 80 miles at Habana, and exceptionally high tides occurred on the south Atlantic coast. Suitable warnings were distributed by the Weather Bureau, hurricane signals being displayed on the south Atlantic coast as far north as Charleston, in consequence of which 120 vessels of various sizes, from fishing smacks to ocean steamers, including 2 U. S. Revenue steamers, valued, with their cargoes, at upwards of a million dollars, remained in port, Twelve seagoing vessels were detained in port at Nassau, New Providence, by this warning which was telegraphed to the authorities there by the Weather Bureau observer at Jupiter.

XII.—This was a very feeble depression, forming on the 23d in Alberta and moving directly eastward to the Gulf of St. Lawrence by the 26th, practically without precipitation and with slight changes in the temperature.

XIII.—This area formed also in Alberta on the 24th, moved east in the northern circuit to Lake Superior on the 26th, where slight showers occurred on the western side; on the 27th rain fell throughout the Lake Region and the Ohio Valley, the low being central near Lake Huron; on the 28th the

rain area and the storm advanced to New England, and on the 29th it had dissipated.

XIV.—On the 30th and 31st a feeble low formed on the west Gulf Coast, but it caused considerable rain in Texas and Louisiana on the 30th, and also in the Gulf States generally during the 31st.

XV.—On the morning of the 31st a low was formed over the Lakes, at the northern end of the trough, corresponding to which XIV was at the southern extremity. In the evening a well-marked low was central over New Jersey; this may have been a new configuration resulting from the collapse of the trough, which rapidly filled during the day. The rain area was very general east of the Mississippi River during the 31st.

## LOCAL STORMS.

By A. J. HENRY, Chief of Division of Records and Meteorological Data.

There was a notable absence of local storms and destructive winds over the greater portion of the United States. Not since 1886 have so few storms, either general or local, been reported. The record is as follows:

On the 10th a heavy southwest wind prevailed over Lake Michigan, injuring cargoes and wrecking 2 or 3 schooners.

Heavy rains and dangerous gales occurred on the night of the 13th throughout southeastern New England. At Boston, 3.22 inches of rain was reported and shipping in the harbor was injured, but no serious disaster resulted. At Providence, R. I., a large unfinished school building was wrecked. At Portsmouth, N. H., the storm was severe; cellars were flooded and electric wires torn down.

## TEMPERATURE OF THE AIR.

[In degrees Fahrenheit.]

The mean temperature is given for each station in Table II, for voluntary observers. Both the mean temperatures and the departures from the normal are given in Table I for the regular stations of the Weather Bureau.

The *monthly mean temperature* published in Table I, for the regular stations of the Weather Bureau, is the simple mean of all the daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to Table II.

The *regular diurnal period* in temperature is shown by the hourly means given in Table IV for 29 stations selected out of 82 that maintain continuous thermograph records.

The *distribution* of the monthly mean temperature of the air over the United States and Canada is shown by the dotted isotherms on Chart II; the lines are drawn over the high irregular surface of the Rocky Mountain Plateau, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map.

The highest mean temperatures were: Key West, 78.6; Yuma, 75.5; Jupiter, 75.8. The lowest mean temperatures were: In Canada—White River, 30.0; Minnedosa, 33.7; and Qu 'Appelle, 33.8: In the United States—St. Vincent, 39.0; Sault Ste. Marie, 39.6; and Northfield, 39.2.

*As compared with the normal* for October, the mean temperature for the current month was deficient everywhere east of the Rocky Mountains, but in excess over the Plateau Region.

The greatest excesses were: Red Bluff, 4.0; Calgary and Spokane, 3.2; Salt Lake City, 3.1; Baker City, Sacramento, and Yuma, 3.0. The greatest deficits were: Detroit, 6.9; Erie, 6.5; Louisville, 6.2; Sandusky and Toledo, 6.1.

*Considered by districts*, the current departures from normal temperatures are as given in Table 1. The greatest positive departures were: Middle Plateau, 2.0; northern Plateau, 2.5. The greatest negative departures were: Lower Lake, 5.7; Ohio Valley and Tennessee, 5.1; Abilene (southern Slope), 4.6.

*The years of highest and lowest mean temperatures* for October are shown in Table I of the REVIEW for October, 1894. The mean temperature for the current month was not the highest on record at any regular station of the Weather Bureau. It was the lowest on record at Port Huron, 44.0; Detroit, 45.4; Erie, 45.8; Cleveland, 46.7; Sandusky, 47.2; Springfield, Ill., 49.5; Toledo, 46.2; Chicago, 46.2; Green Bay, 42.4; Davenport, 47.4; Des Moines, 48.2; Columbus, 48.2; Cincinnati, 51.2; Indianapolis, 49.4; Louisville, 53.1; Kansas City, 53.2; Springfield, Mo., 53.0; Fort Smith, 56.8; Little Rock, 58.6; Abilene, 60.6; Louisville, 53.1; Lynchburg, 53.5.

The *maximum and minimum temperatures* of the current month are given in Table I. The highest maxima were: 99, Yuma (2d); 95, Fresno (1st); 94, Red Bluff (14th). The lowest maxima were: 65, Block Island (8th), Pysht (18th), Port Angeles (20th); 66, Nantucket (frequently), Wood's Hole (3d), Alpena (2d). The highest minima were: 70, Key West (22d); 64, Jupiter (23d); 63, Port Eades (frequently). The lowest minima were: —3, Williston (29th); —2, Bismarck (29th); 3, Moorhead and Huron (29th); 4, Pierre (29th).

*The years of highest maximum and lowest minimum temperatures* are given in the last four columns of Table I of the current REVIEW. During the present month the maximum temperatures were the highest on record at: Columbia, 92; Corpus Christi, 90; Astoria, 76; Fort Canby, 83; Tatoosh Island, 72; Port Angeles, 65. The minimum temperatures were the lowest on record at: Sault Ste. Marie, 18; Port Huron, 19; Erie, 23; Indianapolis, 22; Columbus, 20; Parkersburg, 20; Lexington, 23; Louisville, 26; Keokuk, 20; Kansas City, 26; Wichita, 29; Concordia, 20; Pueblo, 19; Lander, 10; Rapid City, 10; Pierre, 4; Huron and Moorhead, 3; Bismarck, —2; Williston, —3; Portland, Oreg., 31; Carson City, 20.

*The greatest daily range of temperature and the extreme monthly ranges* are given for each of the regular Weather Bureau stations in Table 1, which also gives data from which may be computed the extreme monthly ranges for each station. The largest values of the greatest daily ranges were: Huron, 55; Bismarck, 54; Havre, 52; Rapid City, North Platte, and Columbia, Mo., 50. The smallest values were: Key West, 13; Jupiter, 15; Galveston and Port Eads, 17; Hatteras and Nantucket, 18. Among the extreme monthly ranges the largest values were: Bismarck, 86; Williston and Pierre, 83; Huron and Moorhead, 78; Rapid City, 75; St. Vincent, 70. The smallest values were: Key West, 17; Port Eads, 19; Jupiter, 21; Titusville, 28; Tampa, Hatteras, Block Island, and Nantucket, 29.

The *accumulated monthly departures* from normal temperatures from January 1 to the end of the current month are given in the second column of the following table, and the average departures are given in the third column, for comparison with the departures of current conditions of vegetation from the normal conditions.

| Districts. | Accumulated departures. | | Districts. | Accumulated departures. | |
|---|---|---|---|---|---|
| | Total. | Average. | | Total. | Average. |
| | ° | ° | | ° | ° |
| New England | + 0.1 | 0.0 | Middle Atlantic | — 9.7 | — 1.0 |
| Upper Lake | + 0.5 | 0.0 | South Atlantic | —16.2 | — 1.6 |
| North Dakota | + 5.0 | + 0.5 | Florida Peninsula | —13.8 | — 1.4 |
| Missouri Valley | + 3.1 | + 0.3 | East Gulf | —17.4 | — 1.7 |
| Northern Plateau | + 3.5 | + 0.4 | West Gulf | —17.5 | — 1.8 |
| | | | Ohio Valley and Tenn. | —13.1 | — 1.3 |
| | | | Lower Lake | — 7.2 | — 0.7 |
| | | | Upper Mississippi | — 0.9 | — 0.1 |
| | | | Northern Slope | — 9.8 | — 1.0 |
| | | | Middle Slope | — 4.6 | — 0.5 |
| | | | Abilene (southern Slope) | —18.3 | — 1.8 |
| | | | Southern Plateau | — 6.3 | — 0.6 |
| | | | Middle Plateau | —10.1 | — 1.0 |
| | | | North Pacific | — 2.2 | — 0.2 |
| | | | Middle Pacific | — 6.0 | — 0.6 |
| | | | South Pacific | — 7.9 | — 0.8 |